



POTATO PRODUCTION FOR KWAZULU-NATAL

Morgan Naidoo, Neil van Rij and James Arathoon – Crop Production

Why grow potatoes?

Potatoes are the world's most widely grown vegetable and the fourth most important crop in KwaZulu-Natal. They have a high nutritional value. About 85% of their dry matter is made up of starch; most of the rest is protein. They are used for both human and animal consumption and can even be distilled for alcohol.

Good agricultural management is the key to successful potato production. An understanding of the crop's requirements and constraints is essential for optimum and cost-effective production of the highest quality under each grower's conditions.

Input costs for potatoes are higher than most crops. Therefore it is essential that growers use "best practice"; by testing the soil, planting virus-free material, controlling pests and diseases, applying sufficient fertilizer and irrigation (where available).

Factors limiting potato production and profitability are:

- | | |
|--------------------|----------------------|
| • Management | • Machinery |
| • Production costs | • Irrigation |
| • Cultivars | • Pests and diseases |
| • Quality | • Harvesting |
| • Marketing | Fertilizer/nutrition |
| • Climate | |

Potato growth stages

The growth and development of the potato plant is divided into five (I-V) stages.

- sprouting
- vegetative growth
- tuber initiation
- tuber bulking
- maturity

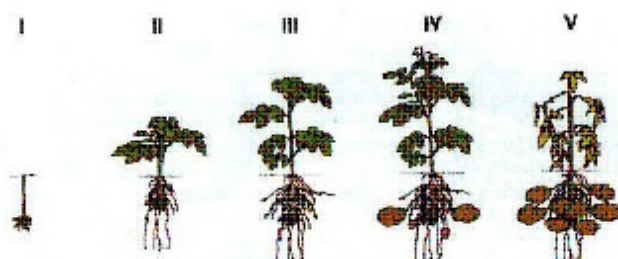


Figure 1: Potato growth stages

During the growth cycle different aspects are important. For example, at tuber initiation (roughly 4-6 weeks after emergence) any drought stress will reduce yield. In the tuber bulking stage the crop puts on up to 1ton/ha per day, so it is vitally important to keep the leaves healthy and maintain adequate moisture levels at this time.

Potato climatic requirements

- Cool growing conditions (average temperature 7°C -20°C).
- Little or no frost.
- Good supply of moisture (800 - 1200mm/year).

Soil requirements

- Can be grown in a variety of soils, but best results are obtained from light soils.
- Good soil structure with lots of organic matter.
- Good drainage and depth.

Fertilizer requirements

- Potatoes require large quantities of fertilizer.
- Take soil samples to determine what type and quantity of fertilizers are required for the expected yield.

Manure can be used, but will depend on:

- quality
- price
- availability
- transport cost
- implements available.

Potato seed and cultivar choice

Use disease-free certified seed.

Seed for planting must be well sprouted. Handle with care to prevent bruising and broken sprouts.

Cultivar choice depends on disease resistance, climate, adaptability and use of crop, e.g. table, crisps, French fries.

Table 1: Some commercially available cultivars

Cultivar	Use		Days to foliage die-off	Disease susceptibility		
	Good	Poor		Late blight	Early blight	Scab
Mnandi	T, FF	C	90-120	M	M	T
Astrid	T, FF	C	90-120	M	M	
BP1	T, FF, C		90-110	S	S	S
Ronn	T, FF	C	90-120	M	M	M
Buffelspoort	T, FF, C		80-100	S	S	S
Calibra	T, FF, C		80-100	M	M	R
Darius	T, FF	C	90-110	M	S	M
Vanderplank*	T, FF	C	70-90	M	MS	S
Up-to-Date	T, FF, C		90-120	VS	VS	S
T-Table; FF-French Fries; C-Crisps			*tuber dormancy 90-110	T-Tolerant; M-Moderate MS-Moderate Susceptible S-Susceptible VS-Very Susceptible		

Land preparation

If necessary spray the field with glyphosate (Roundup) to kill off any weeds. After two weeks, rip, plough and disc the field to prepare a good seed-bed.

Planting dates

In cooler areas plant in:

- Spring (August/September/October) – slow development of tubers
- Summer (January) – quick development of tubers because temperatures are decreasing and day lengths are becoming shorter.
- Winter (April/May) – Frost-free areas under irrigation.

Planting

Plant into a well-prepared fine seed-bed. Dig or pull furrows 90cm apart and 15cm deep, then place fertilizer in the furrows and cover with soil (to prevent fertilizer burn on the seed). Place the tubers in the furrow 30cm apart and cover with soil.



Figure 2: Drawing furrows for planting



Figure 3: Placing fertilizer before covering with a thin layer of soil

Weed Control

To control weeds, spray pre-emergence herbicides registered for grasses and broadleaf weeds immediately after planting. See “A Guide to the Use of Herbicides” for a list of registered herbicides or consult an agrochemical representative.

Ridging

Nitrogen is one of the most important elements needed for growth because a shortage can result in yield losses. When the plants are about 300 – 500mm tall (or at bud stage) apply nitrogen (LAN/urea) as a side-dressing and then ridge the potatoes by tractor or by hand. Ridging prevents tuber moth damage, tuber greening, diseases on the tubers and keeps the plants upright.



Figure 4: Side-dressing prior to ridging



Figure 5: Ridging

Diseases affecting potatoes

Late blight, early blight, scab, leaf roll virus, mosaic virus and nematodes (eelworm).

Potatoes must be sprayed weekly with fungicides and insecticides registered for use in South Africa. See “A guide for the control of plant diseases”.



Late Blight



Early Blight



Scab



Nematodes

Figure 6: Diseases /pests of potatoes

Harvesting

Harvest potatoes two weeks after die-back, when the tuber skin is firm. Harvesting can be delayed in cooler areas if market prices are fluctuating. Harvest potatoes with a mechanical lifter or by hand and move tubers to a cool, dry area. Beware of damage to the tubers, which leads to rotting. A delay in harvesting summer potatoes can cause tubers to go “glassy”. Wash and grade potatoes after harvesting according to market grading requirements. Bag and label the potato pockets according to the size and cultivar.

Crop Rotation

Practice crop rotation, for example dry beans, maize, potatoes, maize or three years *Eragrostis curvula* (especially where nematodes are a problem) then potatoes. Do not plant potatoes in the same field year after year. This causes a build-up of diseases and nematodes.

By following these basic guidelines, and with common sense, growers will be able to produce a good quality crop.

For further information:

Morgan Naidoo: (033) 355 9499

Neil van Rij: (033) 355 9159

A guide to the use of herbicides

A guide for the control of plant pests

A guide for the control of plant diseases

All these guides are published by the National Department of Agriculture: Directorate Food Safety and Quality Assurance and obtainable from:

Directorate Agricultural Information Services,

P/Bag X144,

Pretoria,

0001,

Republic of South Africa.

Tel: (012) 319 7141

Fax: (012) 319 7260

